http://www.epa.gov/woodheaters/models.htm
Last updated on Thursday, November 13th, 2008.

Hydronic Heaters

EXHIBIT 4
DATE 2-5-09
HB 262

List of Cleaner Hydronic Heaters

Breathe Easier with Cleaner Outdoor Wood-Fired Heaters (PDF) (1pg, 451k, About PDF)

Below are 3 lists of cleaner burning hydronic heaters that qualify for the EPA voluntary program. The first table is for models that qualify for the Phase 2 white tag (about 90 percent cleaner than unqualified models). The second table is for models that qualify for the Phase 1 orange tag for "year round" use (about 70 percent cleaner than unqualified models). Please note that although the tag is calculated for year round use, some jurisdictions may not allow "year round" use (i.e., not during summer for just hot water rather than heat). The third table is for models that qualify for the Phase 1 orange tag for "heating season use only." These emissions are calculated as if the model is only used during the heating season. Please note that some jurisdictions do not allow models that only qualify for "heating season use only" because their emissions would be greater if they are used year round.

Please Note that some States and/or local jurisdictions do not allow models that only qualify for "Heating Season Only" use. Also, please note that all data below are according to EPA Method 28 OWHH unless otherwise noted. One manufacturer has asked to use the "cordwood exception" to use the ASTM cordwood test method in lieu of the EPA method. Labels based on the "cordwood exception" expire 12/31/08.

Phase 2 White Tag Models

Manufacturer	Model Name & Number	Heat Output Rating (1)	Efficiency (1)	Annual Average Emission Rate	Heat Input (2) Annual Average Emission Level	Heat Output Annual Average Emission Level	Highest Individual Test Run
Central Boiler	Maxim M250	212,453 BTU/hr	87.8 % high heating value 95.54 % low heating value	1.6 grams/hr 0.07 grams/hr/10,000 BTU output	0.05 lbs/million BTU input	0.06 lbs/million BTU output	4.9 grams/hr
Central Boiler	E - Classic 2300	160,001 BTU/hr	74.94 % high heating value 85.74 %	6.4 grams/hr 0.06 grams/hr/10,000	0.20 lbs/million BTU input	0.31 lbs/million BTU output	17.6 grams/hr

			low heating value	BTU heat output			
Greenwood Technologies, LLC	Aspen 175	66,290 BTU/hr	67.5% high heating value 77. 2% low heating value	8.4 grams/hr 0.18 grams/hr/10,000 BTU heat output	0.18 lbs/million BTU input	0.27 lbs/million BTU output	18.0 grams/hr
Hardy Manufacturing Co., Inc.	KBP 270	120,000 BTU/hr	72.3% high heating value 77.9% low heating value	2.96 grams/hr 0.23 grams/hr/10,000 BTU output	0.10 lbs/million BTU input	0.20 lbs/milion BTU output	6.03 grams/hr
Northwest Manufacturing, Inc. (Woodmaster)	AFS 900	107,069 BTU/hr		2.49 grams/hr 0.27 grams/hr/10,000 BTU output	0.11 lbs/million BTU input	0.20 lbs/million BTU output	7.38 grams/hr
Silverwinds Metals (Wood Doctor)	WD-HE8000	112,655 BTU/hr	66.3 % high heating value 75.8 % low heating value	6.1 grams/hr 0.09 grams/hr/10,000 BTU output	0.17 lbs/million BTU input	0.26 lbs/million BTU output	17.4 grams/hr

1 - Based on 8-hour test for stick wood models and 4-hour test for continuous feed models.
2 - EPA Phase 2 qualified level is 0.32 pounds of fine particles per million BTU of heat output (weighted average representing the range of burn rates expected in a year) and a maximum individual test run of 18.0 grams per hour. Typically, the maximum individual test run is the maximum heat output burn rate.

Phase 1 Orange Tag "Year Round" Models

Manufacturer	Model Name & Number	Heat Output Rating (1)	Annual Average Emission Rate	Heat Input (2) Annual Average Emission Level	Heat Output Annual Average Emission Level	Highest Individual Test Run
Greenwood Technologies	Aspen 175	66,290 BTU/hr	8.40 grams/hr 0.18 grams/hr/10,000	0.182 lbs/million BTU heat input	0.27 lbs/million BTU heat output	18.023 grams/hr

			BTU heat output			
Central Boiler	E - Classic 2300	160,001 BTU/hr	6.4 grams/hr 0.06 grams/hr/10,000 BTU heat output	0.20 lbs/million BTU heat input	0.31 lbs/million BTU heat output	17.60 grams/hr
Central Boiler	E - Classic 1200	89,613 BTU/hr	7.5 grams/hr 0.15 grams/hr/10,000 BTU heat output	0.33 lbs/million BTU heat input	0.59 lbs/million BTU heat output	19.94 grams/hr
Heatmor	200 SSR	71,923 BTU/hr	20.3 grams/hr 0.42 grams/hr/10,000 BTU heat output	0.35 lbs/million BTU heat input	0.76 lbs/million BTU heat output	33.4 grams/hr
Heatmor	SSR 400	157,784 BTU/hr	31.3 grams/hr 0.29 grams/hr/10,000 BTU heat output	0.41 lbs/million BTU heat input	0.68 lbs/million BTU heat output	30.6 grams/hr
Bioheat Resources	BH500 Eco Energy	73,067 BTU/hr	28.54 grams/hr 0.478 grams/hr/10,000 BTU heat output	0.479 lbs/million BTU heat input	0.77 lbs/million BTU heat output	71.602 grams/hr
Sequoyah Paradise	E3400	101,020 BTU/hr	21.88 grams/hr 0.42 grams/hr/10,000 BTU heat output	0.488 lbs/million BTU heat input	2.37 lbs/million BTU heat output	34.77 grams/hr
Hardy	KB175	66,681 BTU/hr	16.3 grams/hr 0.31 grams/hr/10,000 BTU heat output	0.54 lbs/million BTU heat input	0.87 lbs/million BTU heat output	42.7 grams/hr
Greenwood Technologies (3)	100	18,248 BTU/hr	15.205 grams/hr 1.090 grams/hr/10,000 BTU heat output	0.564 lbs/million BTU heat input	2.046 lbs/million BTU heat output	17.80 grams/hr

1 - Based on 8-hour test for stick wood models and 4-hour test for continuous feed models.
2 - EPA Phase 1 level is 0.60 lbs/million BTU. Emission levels are annual averages unless qualified for heating season use only.
3 - These data are via the "cordwood exception," i.e., according to the ASTM cordwood method in lieu

of EPA Method 28 OWHH.

Phase 1 Orange Tag "Heating Season Only" Models

Manufacturer	Model Name & Number	Heat Output Rating (1)	Heating Season Average Emission Rate	Heat Input (2) Heating Season Average Emission Level	Heat Output Heating Season Average Emission Level	Highest Individual Test Run
Greenwood Technologies	Aspen 175	66,290 BTU/hr	11.58 grams/hr 0.25 grams/hr/10,000 BTU heat output	0.186 lbs/million BTU heat input	0.28 lbs/million BTU heat output	18.023 grams/hr
Central Boiler	E - Classic 2300	160,001 BTU/hr	8.6 grams/hr 0.08 grams/hr/10,000 BTU heat output	0.21 lbs/million BTU heat input	0.32 lbs/million BTU heat output	17.60 grams/hr
Central Boiler	E - Classic 1200	89,613 BTU/hr	9.1 grams/hr 0.17 grams/hr/10,000 BTU heat output	0.31 lbs/million BTU heat input	0.51 lbs/million BTU heat output	19.94 grams/hr
Sequoyah Paradise	E3400	101,020 BTU/hr	20.10 grams/hr 0.31 grams/hr/10,000 BTU heat output	0.37 lbs/million BTU heat input	1.48 lbs/million BTU heat output	34.77 grams/hr
Greenwood Technologies (3)	100	18,248 BTU/hr	13.643 grams/hr 0.863 grams/hr/10,000 BTU heat output	0.418 lbs/million BTU heat input	1.362 lbs/million BTU heat output	17.80 grams/hr
Alternative Fuel Boilers	EBW150	27,441 BTU/hr	14.14 grams/hr 0.576 grams/hr/10,000 BTU heat output	0.434 lbs/million BTU heat input	0.80 lbs/million BTU heat output	24.05 grams/hr
Bioheat Resources	BH500 Eco Energy	73,067 BTU/hr	28.54 grams/hr 0.478	0.479 lbs/million BTU heat input	0.90 lbs/million BTU heat	71.602 grams/hr

			grams/hr/10,000 BTU heat output		output	
Aqua-Therm	Omega 100	63,807 BTU/hr	23.80 grams/hr 0.515 grams/hr/10,000 BTU heat output	0.551 lbs/million BTU heat input	1.17 lbs/million BTU heat output	26.988 grams/hr

1 - Based on 8-hour test for stick wood models and 4-hour test for continuous feed models.
2 - EPA Phase 1 level is 0.60 lbs/million BTU. Emission levels are annual averages unless qualified for heating season use only.
3 - These data are via the "cordwood exception," i.e., according to the ASTM cordwood method in lieu of EPA Method 28 OWHH.

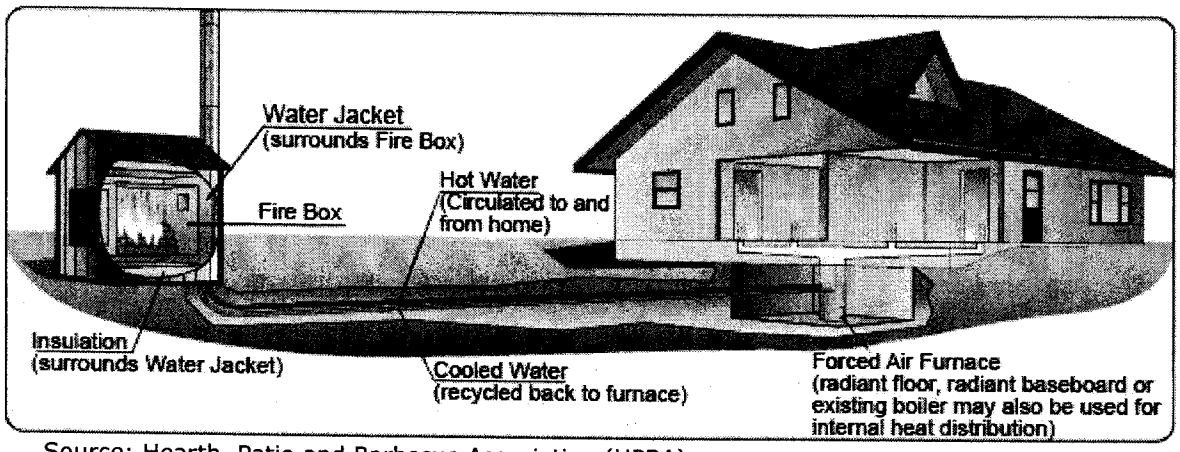
Hydronic Heaters

http://www.epa.gov/woodheaters/basicinfo.htm
Last updated on Thursday, October 23rd, 2008.

Basic Information

Look for the white hang tag for Phase 2 models that are approximately 90 percent cleaner than models that do not qualify.

An outdoor wood-fired boiler (OWB) is an example of a hydronic heater. OWB typically are located outside the buildings they heat in small sheds with short smokestacks. Typically, they burn wood to heat liquid (water or water-antifreeze) that is piped to provide heat and hot water to occupied buildings such as homes, barns and greenhouses. However, hydronic heaters may be located indoors and they may use other biomass as fuel (such as corn or wood pellets).



Source: Hearth, Patio and Barbecue Association (HPBA)

Unqualified hydronic heaters can be substantially dirtier and less efficient than most other home heating technologies. With their smoldering fires and short smokestacks (usually no more than six to ten feet tall), hydronic heaters create heavy smoke and release it close to the ground, where it often lingers and exposes people in the area to nuisance conditions and health risks.

Although most units are designed to burn dry, seasoned wood, some people use them to burn green wood, which generates much more smoke. Others burn household trash or construction debris, which not only release harmful chemicals and pollution, but can be against state law.

Hydronic heater emissions are a significant concern in many local areas. Numerous scientific studies report potentially serious adverse health effects from breathing smoke emitted by residential wood combustion. Residential wood smoke contains fine particles, which can affect both the lungs and the heart. In some areas, residential wood smoke can be a significant source of exposure to fine particle pollution.

Many local agencies have developed ordinances that ban unqualified hydronic heaters and establish minimum distances to neighbors and minimum stack heights. EPA provided

technical and financial support for the Northeast States for Coordinated Air Use Management (NESCAUM) to develop a model rule that state and local agencies can use to regulate hydronic heater emissions.

EPA also has initiated a voluntary program for manufacturers of hydronic heaters. EPA's primary intent is to first encourage manufacturers to produce cleaner hydronic heater models. EPA also wants those who buy a hydronic heater to buy the cleanest models available, which are those that qualify for the EPA voluntary program. In addition, the program will focus on educating new and current hydronic heater users on the health effects of wood smoke, what to look for when purchasing these units, and how to properly operate a hydronic heater.

This program encourages manufacturers to produce and sell cleaner, more efficient hydronic heaters. To participate in the hydronic heaters program, manufacturers commit their best efforts to develop cleaner models, approximately 70 percent cleaner for phase 1 orange hang tag and approximately 90 percent cleaner for Phase 2 white hang tag.